MEDICAL HISTORY

The bosom serpent

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According to one of the old Viking annals, the *Flatø Book*, King Harald Hårdråde of Norway once visited the nobleman Halldor, whose daughter had been very ill. Fever, increasing abdominal girth and an unquenchable thirst were the major symptoms. The old women gossiped about her being pregnant, but the young lady denied this with great vehemence. Since she was steadily declining, the King was consulted. His diagnosis was that she had accidentally swallowed the spawn of a serpent when she drank water, and the reptile had grown within her. To rid her of this bosom serpent, she was to thirst for several days without being given any water; after that, she should be taken to a waterfall, and open her mouth so wide that the thirsty snake could hear the streaming water. When it slithered up her gullet and stretched its head out between the girl's jaws, her father was to strike it with his sword. After the King had left Halldor's house, this cure was performed exactly as he had prescribed; the bosom serpent was decapitated and the girl was restored to health.

SNAKE-EXPELLING SAINTS

The belief in living snakes, frogs, lizards and other animals as parasites within the human gastrointestinal tract is of considerable antiquity. Already in ancient Egyptian, Assyrian and Babylonian manuscripts there is mention of a 'colic-snake' as a cause of painful stomach cramps. In *De Morbis Vulgaribus*, Hippocrates describes the case of a youth who had drunk a great quantity of strong wine. When he passed out on the ground, a snake slithered down his throat and caused his death from an apoplectic seizure.

Very early on, however, there seems to have been some opposition to the established belief in stomach snakes. The learned Alexander of Tralles, living in Lykia during the sixth century AD, was once consulted by a woman who was certain she had a snake in her stomach[1]. He soon understood that she was a hysteric, and that the snake existed only in her imagination. He asked her to describe exactly what she thought the animal looked like, and then procured a similar specimen, which he put in her bowl of expectorations. The woman was completely cured, and she was deeply grateful to her clever physician.

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At about the same time, in Germany, a young lad with a snake in his stomach was taken to the holy Monegunde after many doctors and quacks had considered him to be incurable. With her hand, the holy woman could feel the snake moving in his intestines. She then fastened a small cross to a vine-leaf, which was tied to the boy's stomach. This magic formula had the desired effect: in a vulcanic opening of the bowel, the snake was expelled like a projectile[1,2].

The bosom serpent also plays a part in one of the legends about the medical saints Cosmas and Damien, who were martyred in AD 283. A poor peasant was tortured day and night by a large snake that had crawled down his throat while he slept. No doctor could help him, but when he stepped into Cosmas and Damien's church the serpent slithered up his throat with great haste. Together with the rest of the congregation, the peasant fell on his knees to praise the Lord and the two saints with song and prayers. This miracle is depicted on an early 14th century fresco in the Metropolitan cathedral in Mistra (Figure 1), as well as on the reliquaries of the two medical saints in Munich and Krakow[3,4].

SNAKES AND FROGS IN THE STOMACH

Many of the old collections of curious medical cases contain stories of snakes, frogs, toads and newts living in the human

Figure 1 **St Cosmas and St Damien expel a snake from the stomach of a peasant. From a fresco in the Cathedral of Mistra**

stomach[4,5]. In his *Observationes Medicorum Rariorum*, Johannes Schenckius declared himself convinced that swallowed frog-spawn could adhere to the stomach and develop therein; the colony of frogs lived and bred with ease within the human gastrointestinal canal, with the result that the patient was deprived of all his nourishment, which was consumed by the hungry frog-farm within him.

In 1618, the Prebendary of Strasbourg, Dr Melchior Sebizius, reported another famous case[6]. A 17-year-old youth had consulted him for stomach pains, melancholia, flatulence and epileptic seizures but he had been unable to diagnose the ailment. Some weeks later, the youth was found sitting dead in a bog-house; beneath the seat, a large snake was crawling about. In a thesis, illustrated with a figure of the snake (Figure 2), Melchior Sebizius concluded that the unhappy youth's afflictions could all be explained by the presence of the snake in the stomach for an extended period of time, and that the strain of expelling it from his body had induced a fatal apoplectic fit.

According to his *Des Monstres et Prodiges*, Ambroise Paré also encountered the bosom serpent. In 1561, he met a Paris woman who he rather offensively described as *une grosse garce fessue, potelée et en bon point*; she had caused a great uproar in Paris by claiming that she had a snake in her stomach which had crawled into her while she slept in a hemp-field. Many Parisians came to see her and feel the snake's motions in her stomach. Ambroise Paré had strong suspicions that the whole thing was a fake; he examined her with a long specule, which he brought into her gullet, but he saw no sign of the snake. He threatened her that she was to be given an extremely powerful laxative, which would with certainty rid her of the parasite. She then admitted that the story of the snake was a pure invention, and withdrew from further treatment, but Ambroise Paré saw her again six days later standing near the Montmartre gate and inviting men to come and feel the snake in her stomach.

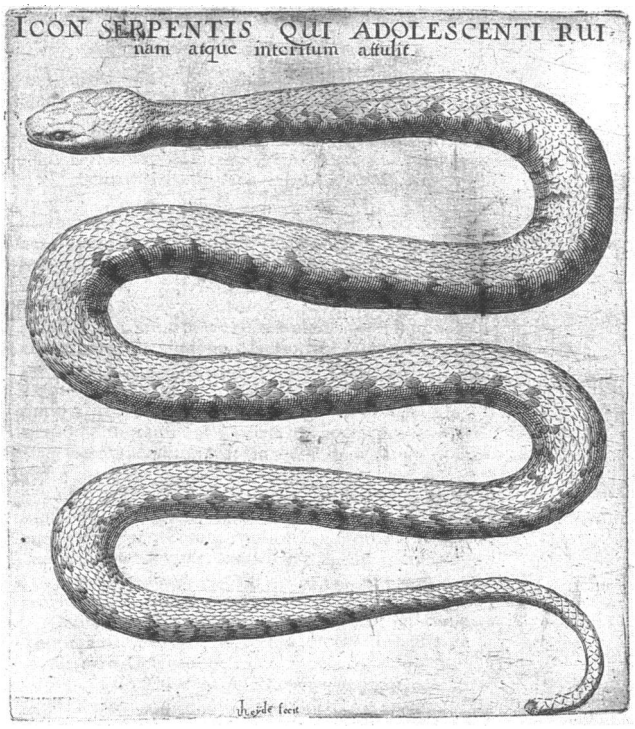

Figure 2 **The stomach-snake described by Melchior Sebizius, from his thesis**

TWO FAMOUS CASES

The most famous of all patients with alleged amphibians in the stomach was Frau Catharina Geisslerin, who was widely known among her contemporaries as the toad-vomiting woman of Altenburg[4,7]. In 1642, she took the first step towards notoriety by vomiting several toads and lizards. She claimed that she had accidentally imbibed spawn while drinking foul water in a marshland; the toads, frogs and lizards were now fully grown and thriving on the ready-chewed food that was delivered to them thrice daily. She could feel them running and sporting in the intestines, especially after she had drunk milk, which the animals particularly liked. After she had vomited toads for more than two years, the local physician considered that this bizarre case went far beyond his own therapeutic ability; several well-known professors and consultants were invited to come and examine her. Although they experimented with various emetics and purgatives for several months, they were unable to chivy the animals out from their lairs. In May 1648, when the medical men had left her, Catharina Geisslerin again started vomiting amphibians: 13 toads and a large quantity of spawn were produced in a couple of weeks. The toad-vomiting woman continued to suffer from her unruly lodgers until her death at the Altenburg hospital in 1662. The medical men were, of course, eager to perform a necropsy, expecting to find an interesting vivarium of toads, lizards and salamanders within her body. To their disappointment, not a single animal was found.

In 1694, the 12-year-old son of Pastor Zacharias Döderlein, of Berolzheim in southern Germany, was taken severely ill[8]. After several fits and attacks of abdominal cramps, he vomited numerous insects, and later also 21 newts, 4 frogs and some toads (Figure 3). These uncanny happenings soon attracted notice among the clergy: many German parsons came to visit the house of their stricken colleague and their diagnosis was that the boy was possessed by the Devil; what particularly impressed them was that when the boy was led to take some fresh air near a pond with croaking frogs, his stomach-frogs croaked loudly in reply. When the local doctor expressed doubt as to the ability of a multitude of frogs to survive inside a human

Figure 3 **Young Theodorus Döderlein vomits a veritable torrent of lizards, frogs and other animals** (From Georg Abraham Mercklin's thesis *De Incantamentis*)

being, the clergymen reminded him that, if Jonah could have survived within the whale, the reverse should also be possible. The medical men were dismissed from the case, and the treatment of young Theodorus was taken over by the exorcists. On one occasion they thought they saw a large snake thrust its head out through the boy's mouth, but when the muscular Christians rushed forth, eager to 'pull the Devil out and thrash the life out of him', it hastily withdrew to its lair among his intestines. Meanwhile, a physician had dissected one of the vomited 'frogs from hell'. It had several half-digested insects in its stomach—evidence that it had been alive outside the boy's body shortly before being 'vomited'. This deduction was not made by the boy's attendants. Instead, the clergymen experimented by pouring horses' urine, a time-honoured cure for animals in the stomach, on the remaining live frogs. The animals promptly died, and it was unanimously decided to try this strong 'medicine' on poor Theodorus, who was forced to swallow several large bottles of urine. Under the influence of solemn prayers and incantations of exorcism, this drug worked miracles. Theodorus stopped vomiting frogs and other strange objects, and the clergymen were certain that the devils had been exorcized[8,9]. One would rather presume, however, that the threat of a second generous helping of horses' urine had deterred the mischievous Theodorus from performing any further pranks.

CARL LINNAEUS AND A CURE FOR FROGS IN THE STOMACH

During his journey to Lapland in 1732, Carl Linnaeus was consulted by the wife of the parish organist in the little town Lycksele. She complained of having three live frogs in her stomach, which could clearly be heard croaking, particularly in the springtime. Linnaeus advised her to use liquid tar as a medicine to expel the animals, but she preferred taking large doses of strong aquavit, which at least kept the animals happy and quiet. In his medical conclusions to the *Iter Lapponicum*, Linnaeus stated as a fact that frogspawn, left floating in the brooks and streams by the adult frogs, was a serious threat to the health of the Laplanders: if they drank this polluted water, the spawn adhered to the membranes of the stomach, which hereafter 'formed the nest, or rather the pond, for these dreadful animals, which tear and torture the poor patient'.

In the late 18th century, most of the leading biologists, including Linnaeus, Buffon and Blumenbach, favoured the notion that snakes and frogs could live as parasites in the human gastrointestinal tract. Two impressive reviews were written in 1779 and 1802[9,10]. In the early 1800s, more cases were published than ever before. A worthy example is that of the serving-girl of the parson of Dunfermline, whose doctor had given her a strong dose of calomel for stomach pain and constipation. This medicine had the desired effect, but she was greatly frightened by passing also a small lizard, which leaped out of the chamberpot and darted in under the drawers. When she pulled the animal out with a poker and flung it on the fire, it expired with a shrill squeak[11]. Many reports in a similar vein can be found in European[12–16] and American[17] medical journals.

In 1834, a certain Dr Sander was consulted by the 30-year-old Frau Henriette Pfennig, who claimed to have vomited two live frogs after being troubled by stomach cramps, anxiety and strong quacking noises from the midriff for more than a year[18]. In the succeeding weeks she vomited 9 more frogs before an admiring crowd of spectators, several of whom had travelled for miles to see this celebrity and hear the frogs croaking within her. Dr Sander dissected one of the frogs that Frau Pfennig had vomited and was greatly astonished to find several half-digested insects and an almost intact beetle in its stomach. He also made experiments on those of the vomited frogs that were still living, finding that they were unable to live more than a very short time in the temperate clime within the human body. With these highly suspicious circumstances in mind Dr Sander went to the city magistrate, who bullied and threatened the poor woman severely. Weeping profusely, she admitted the hoax: after her neighbours had doubted that she really had frogs in her stomach, she had taken these animals in the inside pockets of her skirt. To gain sympathy and public attention, she had pretended to cough them up—with enough skill to trick everybody present, including the medical men.

The defenders of the bosom serpent rallied round a new case report[19], judged the best authenticized ever. The

Russian court physician Martin Wilhelm Mandt had been consulted by a peasant who was certain that a snake had slithered through his mouth when he was sleeping out in the open. The peasant had awoken with a jerk, feeling that something cold moved round in his stomach. After taking a couple of stiff vodkas to calm himself and the snake, the peasant jumped onto his horse and rode off at a gallop to seek medical assistance. The noble ladies and gentlemen who were strolling in the park at Grand Duke Michail Pavlovitch's summer palace outside Oranienbaum were probably astonished to see the dishevelled peasant spurring his mount through the hedges and flower beds, and calling out loudly that only the foremost physician in the land could help him, since he had a snake in his stomach. Dr Mandt managed to calm him down, and after he had been put to bed performed a thorough examination of his abdomen. Movements could be felt in the epigastric areas, and a gargling sound was heard with the stethoscope. After four days, Dr Mandt administered a strong purgative. The man soon felt better and the movements in his stomach ceased. He went home to recuperate and returned triumphantly two days later carrying a chamber-pot containing the body of a 12-inch adder.

Dr Mandt's case was widely published across Europe in translation, and even went the rounds of the newspapers. Since it was illustrated with a picture of the snake, his article did much to re-establish the old fallacy. But even this famous case crumbles before a critical reexamination. That a serpent of this considerable size, as thick as a strong man's finger, could have crawled through the throat and gullet of a sleeping man without waking him, is utterly absurd to anyone who ever held a laryngoscope. Nor is it possible for a snake to live four days in the human stomach. There were no witnesses either to the snake's dramatic entrance or its unceremonious expulsion. Dr Mandt noted that the reptile's backbone was broken at several sites and judged that the fractures had been caused by the powerful contractions of the bowel. A more likely explanation is that its back was broken when it was killed. Furthermore, the snake's body would certainly have been more extensively digested if it had passed through the entire gastrointestinal system of a man.

BERTHOLD'S INVESTIGATION

In 1850, Professor Arnold Adolph Berthold, of Göttingen, published a monograph aimed at solving the burning question of the existence of living amphibians as parasites in the human stomach[20]. He had noted that almost every German pathological museum of repute contained some snake, frog or newt which had allegedly been vomited by some patient after living for years within the human body. Berthold obtained permission to dissect several of these specimens and all had partly digested insects in their stomachs—a strong indication that they had been deliberately swallowed shortly before being vomited. These findings inspired Berthold to assess by experiment whether frogs and lizards could live within the clime of the human body. The results were that none of these animals could survive in water at 29°C, and that frogspawn putrified at this temperature. Arnold Adolph Berthold was unequivocal in declaring that the spawn of frogs and toads could not develop within the human body, and that all reports of newts and amphibians living as parasites in the human body must be false. Since Berthold had probably also read and appreciated John Hunter's pioneer work on the nature of the gastric juice, it is odd that he did not consider the acid and digestive effects of this fluid on the alleged parasites; this line of inquiry was instead pursued by the American physiologist J C Dalton 15 years later[21]. He demonstrated that slugs could not live in a temperate environment, and that they were digested by the gastric juices of a dog. To clinch the argument, he fed a dog with live slugs and newts without letting it chew them; when the dog was killed an hour later, the animals were all dead and partly digested.

The most recent European case of a frog in the stomach reported in a medical journal occurred in 1882, when a female patient of the Austrian practitioner Dr Weiss claimed to have vomited a live frog after suffering from abdominal discomfort for some time. The naïve doctor was quite convinced of the reality of this strange occurrence[22], but when he published the case his professional brethren protested that they had many times observed hypochondriacs complaining about snakes or frogs in the stomach *mit geradezu unerschütterliche Hartnäckigkeit*[23]. The outcome was that the editor of the *Wiener Medizinische Blätter* had to apologize to the readers for giving credence to such an absurdity.

At a time when it had become a largely disregarded phenomenon in European medicine, the bosom serpent found new friends in the United States. In 1881, a Texas farmer vomited 'a snake twenty-one and a quarter inches long, of the prairie coachwhip variety', which had bothered him for six months; he threw it on the floor and his wife killed it[24]. Another report described the case of a lady who had felt something moving in her stomach for four months. She was ridiculed by her friends as a hysteric, but she silenced them by vomiting a nearly fully grown mouse, which her doctor kept in a glass jar in his office, as a pet[25]. As late as 1891, a credulous American practitioner described 'a patient whose ailment is of a most unique character', a farmer who had brought up a living frog after 18 months of abdominal discomfort[26].

8 years later, Professor Alfred Stengel of the University of Pennsylvania was much more cautious while describing

two patients he had treated for alleged snakes in the stomach[27]. He had tried to deceive one of the patients by sedating him while passing a stomach tube; after the stomach had been washed out, a live snake was produced. The man was overjoyed, but some days later he complained that the snake must have had young while within him; he could feel them writhing in the intestines. He was then discharged from hospital as incurable; after his death 2 years later, necropsy revealed chronic hypertrophic gastritis. Another individual, a 34-year-old farmer, was admitted to Professor Stengel's wards complaining of a snake in the stomach. His principal lament was that 'he will never allow me to drink whisky; he hates that worse than anything else'. The man had for some time been able to eat only bread; he was emaciated, nervous and of feeble intellect. He was treated by stomach lavage, after which he had free access to tonics and nourishing food. A month later he had gained 15 pounds in weight, and he was convinced that the sensation of a snake in the stomach had been a delusion. Professor Stengel pointed out that many other presumed cases of living animals in the stomach also were due to feeble-minded people misinterpreting the signs of gastritis or some other disease of the stomach or intestines.

BOSOM SERPENTS IN FOLKLORE

Stories of snakes, frogs and lizards living in the human intestinal tract exist in the folklore of Britain[28,29], the USA[30,31], Scandinavia[4] and continental Europe[1,2]. A large arsenal of popular cures against these internal parasites existed. Swedish haymakers always took a pinch of snuff before falling asleep in the fields, hoping that the snakes and slow-worms would not desire to negotiate such a formidable obstacle[2,4]. In Scandinavian mythology, the stomach-frogs were much feared, since they were believed to grow to an enormous size; in a tale from Norway, the wretched patient could feel its claws closing in around her heart before she died[32]. Early in 1916, a remarkable story appeared in several English newspapers. A woman had swallowed frogspawn, which had developed inside her into a large frog. She was taken to Stroud Hospital (in Gloucestershire), but the doctors were unable to operate since the animal moved about too fast. The woman was in such agony that the baffled medical men wrote to King George V in order to get his permission to kill her with poison, but his Majesty refused this plea. Instead, as a last resort, the doctors put a piece of cheese on her tongue, and the frog smelt it and jumped up her gullet to eat it; tragically, the obese amphibian was too big to get through, weighing half a pound, and the wretched woman choked to death.

In 1921, another ludicrous story appeared in the Norwegian newspapers[33]. An adder had crawled through the mouth of a young country girl, and, although the nation's foremost physicians had been consulted, they had pronounced her incurable since the reptile had had young inside her. This *canard* was denied by the hospital authorities, but a curious sequel was that no fewer than 18 letters were sent to the hospital by credulous country people, to suggest various household cures for the unhappy girl. An old woman recommended that the girl was to breathe the fumes from newly baked bread, an infallible means of coaxing hungry snakes up from their lair. Her own mother had suffered from snakes in the stomach without knowing it, and one day, after she had fallen asleep while baking, her husband was aghast at seeing seven snakes crawling about on the loaves of bread in front of his sleeping wife. The rough Norwegian killed the snakes and placed them in a row before his wife, before waking her with the words: 'Here are the children you have just given birth to!' The poor woman had a fit and died.

The bosom serpent is still with us, since it has been incorporated among the modern newspaper myths. In 1979, the story of a 15-year-old Turkish girl with three long water-snakes in her stomach, which had existed there for 5 years after being accidentally imbibed as eggs, was given credence by the *Daily Star*. The *Daily Telegraph* went one worse in 1982. A 25-year-old Syrian woman was taken into hospital complaining of severe stomach pains. It was ascertained—perhaps after the surgeon had met the gaze of its reptilian eyes through the fibre optics of his endoscope—that she had a six-foot snake lodged in her intestines.

According to a Syrian newspaper, it made a sound like a chicken when hungry; the cry of the bosom serpent was loud enough to be heard by people standing near her. The Syrian surgeons failed to remove the serpent and the patient was sent to Spain, where a second operation also failed, even though an anaesthetic was used also on the snake. Another *canard* went the rounds of the newspapers in 1987. An 11-year-old girl in Baku had got a 26-inch semi poisonous Caucasian cat snake in her stomach, which had slithered down her throat while she slept. The clever doctors managed to flush it out with a stomach-pump. The *Scotsman* added a further *frisson* by adding that she was still in hospital, being treated for the enraged reptile's bites in the stomach wall.

THE BOSOM SERPENT UNVEILED

No fewer than 68 case reports of live reptiles or amphibians in the human gastrointestinal tract are on medical record; they are evenly distributed over the 17th, 18th and 19th centuries. More than 40 of them were from the German states, where many medical men remained firm friends of the bosom serpent well into the 1840s. 7 cases were from

France, 4 from Scandinavia and only 2 from Great Britain, where such stories never received much support from men of learning. The 5 American cases are all from the late 19th century. Working at the zoological aspects we find that the 68 cases of stomach parasites can be subdivided into 17 concerning snakes, 18 lizards, 12 toads and 15 frogs; in addition, the old 'monster medicine' includes 2 mice, 2 dogs, a cat, a mole and a hen as intestinal parasites.

Some medical historians have suggested that the original 'snakes in the stomach' were large round-worms misinterpreted by simple-minded people[32]. This parasite is not exactly snake-like, but it can be as much as 10 cm long. That the 'snakes' vomited were in fact ascarids is apparent in some early cases, but not in any later ones. This hypothesis is of course completely inadequate when other animals are named as parasites. Nor can any credence be given to the recent suggestion that the bosom serpent mythology arose as a result of misinterpretations of guineaworm infestation[34]. During the 18th and 19th centuries, the fear of having live snakes or frogs within them touched people to the core. It seems as if individuals with some organic or psychosomatic gastrointestinal disease were sometimes seized by the delusion that they had one or more living animals in their stomachs. The protuberance in the hypogastric region demonstrated by many patients as one of the snake's coils often seems to have been a flatus-filled section of the large bowel. This 'internal delusion of infestation' might sometimes progress so far that the patients pretended to vomit living or dead amphibians.

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